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Understanding Gut Fermentation Syndrome in the Psychiatric Evaluation of Patients with Suspected Alcohol Use Disorder



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Introduction

Gut Fermentation Syndrome, also known as auto-brewery syndrome, is a phenomenon not well understood in today's medicine with few articles discussing its etiology, presentation, diagnosis, and treatment. A clinical situation arose where a patient stated abstinence from alcohol use and that Gut Fermentation Syndrome was the cause of continually elevated blood alcohol levels. We will present the suspected etiology, the typical presentation seen, the possible diagnostic studies available, and typical effective treatment. Having this understanding would allow for the psychiatrists involved to give a more thorough recommendation when presented with this clinical situation.

Etiology

Although not thoroughly understood, the hypothesized mechanism is an overgrowth of yeast in the intestines, especially the small bowel, that leads to the fermentation of complex carbohydrates into ethanol. The yeast correlated with Gut Fermentation Syndrome include: *Candida albicans*, *Candida krusei*, *Candida glabrata*, and *Saccharomyces cerevisiae*. Another study combined infant food formulas with several yeast, including *Candida albicans* and *Saccharomyces cerevisiae*, to measure ethanol production *in vitro*. It found that both produced ethanol with *S. cerevisiae* having the most ethanol production.

Presentation

These people claim feeling intoxicated after heavy carbohydrate meals. The feeling will usually begin within an hour of these meals. Some have used breathalyzers to correlate blood alcohol level (BAL), which was typically measured between 0.17 to 0.40%. Certain people used food logs, they found that after low carbohydrate meals there were few symptoms and a negative breathalyzer but if they ate large carbohydrate meals there were many symptoms of intoxication and a positive breathalyzer. Also, none of the people had access to alcoholic beverages or denied alcohol use.

Diagnostic Studies

There is only one diagnostic study at this time, a fasting glucose challenge. The patient is required to fast for 3 hours. After 3 hours, the patient is given a 5 gm glucose load with 1 gm being in a harden gelatin capsule to ensure duodenum passage. One hour after the glucose load, the blood glucose level and BAL are measured. An elevated BAL is considered positive. The study using this diagnostic test found that the BAL was elevated in 61% of the patients. Some studies have revealed that stool studies will have elevated levels of certain yeast like *S. cerevisiae* and *C. albicans*.

Treatment

Oral course of fluconazole 100 mg daily for 3 weeks followed by a course of Nystatin 500,000 IU QID for 3 weeks. During the 6 week course, a strict diet of no sugar, no complex carbohydrates, and no alcohol should be followed. Acidophilus tablets can be used to re-colonize the gut. A discussion should be held about possible diet changes after 6 week course which would include limiting alcohol and carbohydrate heavy foods.

Conclusion

In conclusion, Gut Fermentation Syndrome is chronic yeast infection in the small intestine that leads to intoxication in patients after ingestion of large complex carbohydrate meals. There is only one diagnostic test but has limited effectiveness at this time. The treatment involves two 3 week sequential treatments with antifungals. This syndrome has the possibility of being a defense for people's alcohol use and/or intoxication. However, with this basic understanding it will allow for better investigation to determine the actual cause.

References

1. Hafez EM, Hamad MA, Fouad M, and Abdel-Lateff A. Auto-brewery syndrome: Ethanol pseudo-toxicity in diabetic and hepatic patients. *Human and Experimental Toxicology*. 2016; 1-6.
2. Fayemiwo SA, Adegboro B. Gut Fermentation Syndrome. *African Journal of Clinical and Experimental Microbiology*. 2014;15: 48-50.
3. Bivin W, Heinen B. Production of Ethanol from Infant Food Formulas by Common Yeast. *Journal of Applied Bacteriology*. 1985;58:355-7.
4. Cordell B, Kanodia A. Auto-Brewery as an Emerging Syndrome: Three Representative Case Studies. *Journal of Clinical and Medical Case Reports*. 2015;2(2): 5.
5. Eaton KK, et al. Abnormal gut fermentation: Laboratory studies reveal deficiency of B vitamins, zinc, and magnesium. *Journal of Nutritional Biochemistry*. 1993;4:635-8.
6. Cordell B, McCarthy J. A Case Study of Gut Fermentation Syndrome (Auto-Brewery) with *Saccharomyces cerevisiae* as the Causative Organism. *International Journal of Clinical Medicine*. 2013;4:309-12.
7. Danshan A, Donovan K. Auto-Brewery Syndrome in a Child With Short Gut Syndrome: Case Report and Review of the Literature. *Journal of Pediatric Gastroenterology and Nutrition*. 2001;33:214-15.